

What is claimed is:

*Sub A4)*

1. A method for driving a solid-state image pickup device which stores, in a plurality of photo-electric conversion units, signal charges corresponding to an incident light during a prescribed time period, excludes surplus charges by an electric potential barrier, reads out, after cutting off said incident light by a cut-off means such as a mechanical shutter, said signal charges by grouping said photo-electric conversion units into a prescribed number of regions, and outputs image signal from all of the photo-electric conversion units by repeating the read-out procedures, which comprises the steps of:
  - cutting off said incident light;
  - raising up said electric potential barrier;
  - starting reading out said signal charges.
2. The method for driving a solid-state image pickup device according to Claim 1, wherein the electric potential during the read-out step is raised up by a voltage greater than 0.4 V.
3. The method for driving a solid-state image pickup device according to Claim 1, wherein the electric potential during the read-out step is deeper than an adjacent electric potential which is applied, during the times except said read-out step, to said photo-electric conversion units which are adjacent to those which are being read out.
4. The method for driving a solid-state image pickup device according to Claim 3, wherein the potential difference between said electric potential during the read-out step and said adjacent electric potential is greater than 0.4 V.

5. The method for driving a solid-state image pickup device according to Claim 1, wherein each of said photo-electric conversion units is provided with a vertical overflow drain (OFD) structure which excludes the surplus charges by said electric potential barrier by a voltage applied to a substrate of said vertical OFD structure, which comprises the steps of:

5 cutting off said incident light;

10 raising up said electric potential barrier;

10 starting reading out said signal charges.

6. The method for driving a solid-state image pickup device according to Claim 5, wherein the electric potential during the read-out step is raised up by a voltage greater than 0.4 V.

15 7. The method for driving a solid-state image pickup device according to Claim 5, wherein the electric potential during the read-out step is deeper than an adjacent electric potential which is applied, during the times except said read-out step, to said photo-electric conversion units which

20 are adjacent to those which are being read out.

8. The method for driving a solid-state image pickup device according to Claim 7, wherein the potential difference between said electric potential during the read-out step and said adjacent electric potential is greater than 0.4 V.

25 9. The method for driving a solid-state image pickup device according to Claim 1, wherein each of said photo-electric conversion units is provided with a horizontal overflow drain (OFD) structure which excludes the surplus charges by said electric potential barrier by a voltage applied

to a gate of said horizontal OFD structure, which comprises the steps of:

94

- 5 cutting off said incident light;
- 5 raising up said electric potential barrier;
- 5 starting reading out said signal charges.

10. The method for driving a solid-state image pickup device according to Claim 9, wherein the electric potential during the read-out step is raised up by a voltage greater than 0.4 V.

10 11. The method for driving a solid-state image pickup device according to Claim 9, wherein the electric potential during the read-out step is deeper than an adjacent electric potential which is applied, during the times except said read-out step, to said photo-electric conversion units which 15 are adjacent to those which are being read out.

12. The method for driving a solid-state image pickup device according to Claim 11, wherein the potential difference between said electric potential during the read-out step and said adjacent electric potential is greater than 20 0.4 V.